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ABSTRACT

It is well known that many smokers who quit during cessation programs relapse soon after leaving treatment. To investigate the relationship of health locus of control, social support, nonsmoking areas, and objecting to another person's smoking to relapse and long-term maintenance of nonsmoking, male (N=70) and female (N=149) subjects participated in a single session group hypnosis treatment for smoking cessation and completed questionnaires prior to and 1 year after treatment. Results showed that three smoking status groups could be defined. Exsmokers actively coped with smokers in their environment and received considerable support from family and friends. Recidivists placed greater responsibility for their health on others, did not actively cope with smokers, and were more likely to participate in additional hypnosis. Males tended to be exsmokers, while females tended to be continuing smokers. The findings suggest that post-treatment factors appear to be more important than participant characteristics for long-term maintenance of nonsmoking. (Author/JAC)

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Psychosocial Mediators of Long-Term Abstinence Following Smoking Cessation

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Psychosocial Mediators of Long-Term Abstinence Following Smoking Cessation*

It is now well known that many smokers who quit during cessation programs relapse soon after leaving treatment. Because all forms of treatment experience a high incidence of recidivism within the first year posttreatment, increasing attention is being focused on personal, behavioral, and situational factors associated with relapse and long-term maintenance.

This study investigates the relationship of health locus of control, social support, use of nonsmoking areas, and objecting to another person's smoking to relapse and long-term maintenance of nonsmoking following smoking cessation. Subjects participated in a single session group hypnosis treatment for smoking cessation. Questionnaires were completed by participants pretreatment and at a one-year follow-up. The data were analyzed using multivariate techniques to control for multiple factors known to affect the outcome of smoking interventions, and to determine which factors best discriminate among continuing smokers, recidivists, and long-term abstainers.

* This investigation was supported by the American Lung Association of Western New York, Buffalo, New York.

Background

Sociodemographics and Smoking History

A number of personal and social variables associated with the maintenance of nonsmoking have been investigated. A generally reliable finding is that males are more likely to remain abstinent following organized cessation programs (Harrup, Hansen, & Soghikian, 1979; Hughs, Hymowitz, Ockene, Simon, & Vogt 1981; Reeder, 1977; West, Graham, Swanson & Wilkinson, 1977), or spontaneous quitting (Eisinger, 1971, 1972; Gordon, Kannel, Dawber, & McGee, 1975; Scrole & Fischer, 1973) than females.

While many studies have found that older subjects are more successful at long-term abstinence (Dzegede, Hackworth, & Pike, 1981; Eisinger, 1971; Gordon et. al., 1975; West et. al., 1975), negative results have also been reported (Eisinger, 1972; Scrole and Fischer, 1973; Weinberger, Greene, Mamlin, and Jerin, 1981). Moreover, significant results in the opposite direction have been reported on the relationship between abstinence and the number of years smoked (Eisinger, 1971; Weinberger et. al., 1981).

The available evidence suggests that exsmokers as compared to smokers started regular smoking at a later age (West et. al., 1977). Most studies have also shown lighter smoking habits to be related to successful abstinence (Eisinger, 1972; Gordon, et. al., 1975; Hughs et. al., 1981; Schwartz & Dubitsky, 1968; Scrole & Fischer, 1973; West et. al., 1977). However, nonsignificant results (Graham & Gibson, 1971) and more complex relationships between smoking habits and abstinence (Dzegede et. al., 1981) have been reported.

In Graham and Gibson's (1971) sample, greater success at cessation was associated with fewer attempts at quitting smoking, but these findings were not replicated by Eisinger (1971). A related factor not previously assessed is the duration of previous unsuccessful abstinences.

Several studies suggest that abstinence is related to higher levels of education and being married (Dzegede et. al., 1981; Graham & Gibson, 1971; Scrole & Fischer, 1971).

Health, Health Beliefs, and Health Locus of Control

Previous research also suggests that health status and health beliefs tend to be related to long-term abstinence and relapse. Successful exsmokers report more respiratory symptoms (Graham & Gibson, 1971; Straits, 1970) and psychosomatic symptoms (West et. al., 1977) prior to quitting than persons failing to stop smoking. With the exception of Eisinger's (1972) findings, perceiving a personal vulnerability to the adverse health effects of smoking has been found to be related to quitting (Weinberger, et. al., 1981; West et. al., 1977).

Concerning respondents' beliefs about the relationship between smoking and specific diseases, successful abstainers under 55 as compared to recidivists in Graham and Gibson's (1971) study tended to perceive a higher risk to smokers of contracting lung cancer. However, recidivists in Strait's (1970) and Eisinger's (1971) samples tended to perceive a greater likelihood of contracting certain diseases such as cancer. The latter results were interpreted as

demonstrating that recidivists had a more fatalistic outlook than abstainers.

Rotter (1966) posited that individuals differ in their locus of control, that is, their generalized and specific expectations of control over reinforcement. "Internals" perceive that they have considerable control over the consequences of their actions, whereas "externals" perceive that their life's consequences are not contingent on their behavior.

A number of investigators have suggested that internals should be more successful in their efforts to quit smoking. The results of studies on the relationship of locus of control to smoking cessation have been inconclusive, however. Eisinger (1971), Foss (1973), and Straits (1970) report evidence tending to confirm this prediction; Lichtenstein and Keutzer (1967), and Burton (1977) failed to confirm it. Best and Steffy (1975) found an interaction between type of treatment and internality/externality at the follow-up.

Recently, Shipley, (1981) studied the relationship of control expectancies specific to health and success at cessation using the Multidimensional Health Locus of Control (HLC) scales developed by Wallston, Wallston, and DeVillis (1978). These scales measure beliefs (a) that one controls his or her own health (internal HLC), (b) that chance does, and (c) that powerful others do. Shipley found greater abstinence at the six-month follow-up for subjects high in internal HLC ($p < .10$), and low in chance HLC ($p < .05$). These findings suggest that the multidimensional health scales may be more valuable in studying the smoking withdrawal process than global locus of control scales have proven.

Social Support

The support of significant others can also be an important factor in an individuals ability to cope with stress. Several researchers have examined the relationship between social support and the ability to cope with smoking withdrawal. Straits (1970) and West et. al. (1977) found that spouses' smoking behavior and support was significantly associated with long-term success in smoking cessation. Another study found that the smoking habits of parents and siblings as well as spouses, can influence the likelihood of long-term abstinence (Graham and Gibson, 1971). Eisinger (1972), however, found no significant relationship between success and the smoking status of spouses.

Coping Behaviors

Researchers have shown increasing attention to the responses exsmokers use to cope with threats to continued abstinence (Evans & Lane, 1981); Marlatt & Gordon, 1980; Shiffman, 1982). It is known that relapse can be precipitated by social pressure to smoke (Marlatt & Gordon, 1980) and proximity to another person who is smoking (Shiffman, 1982).

Horwitz (Note 1) has suggested that the perspective of nonsmokers' rights can enhance the effectiveness of smoking cessation and the prevention of relapse. Recent exsmokers might cope with social pressure to smoke and environmental cues to smoke (smoking models, ambient tobacco smoke, ashtrays, etc.) by using nonsmoking areas in public places and by objecting to others' smoking nearby.

These coping behaviors might also help the exsmoker develop an identity as a nonsmoker by strengthening the perception of control over smoking behavior and by creating a support system for nonsmokers in various settings. Evans and Lane (1981) showed that exsmokers were more successful in remaining abstinent when they more frequently avoided other smokers. Moreover, Shiffman (1982) showed that nondepressed exsmokers could survive relapse crises when they engaged in a behavioral coping response such as leaving the stress producing situation.

A study was designed to investigate the relationship of social support, coping behaviors, and health locus of control to long-term success at smoking cessation after minimal treatment when subject differences in personal background, smoking history, and health beliefs are taken into account. Based on previous research it was predicted that long-term success would be associated with greater social support, internal locus of control, and behavioral coping. It was also predicted that continuing smokers and recidivists would be distinguishable from exsmokers and each other on the basis of the variables examined.

Method

Treatment

A total of 789 smokers participated in a single group hypnosis session sponsored by a voluntary health organization. Participants had been recruited via public service announcements in the local media and were charged a $25 fee for the session.

An experienced clinical hypnotherapist conducted four separate groups of 190-200. For the first 70 minutes of the 90-minute session,

the therapist described the principles of hypnosis, shaped expectancies, and answered questions. Hypnotic induction and suggestions were administered in the remaining 20 minutes. Suggestions by the therapist focused on desensitizing participants to cravings to smoke and environmental cues. For example, the therapist suggested that, "other peoples' smoke will not bother you."

Instruments and Data Collection

Questionnaires were completed by participants prior to the group session on the individual's socio-demographic characteristics, smoking status and history, social support, smoking habits of significant others, health status and beliefs, and health locus of control. The Multidimensional Health Locus of Control scales, Form A (Wallston et. al., 1978) were used. Evidence for the validity and independence of the HLC subscales has been reported by Hartke and Kunce (1982), and Shipley (1981).

At one year posttreatment, a follow-up questionnaire and postage-paid return envelope were mailed to all participants. Information was requested on smoking habits, social support, and coping behaviors subsequent to treatment, and current health status, beliefs, and HLC. Nonrespondents were mailed a second questionnaire one month later. Two weeks after the second mailing, nonrespondents were contacted by phone and a postcard reminder was sent a week later. These multiple follow-up procedures yielded questionnaires from 372 participants which is 47.5% of the total. Two hundred forty-six participants (31.4% of the total) who did not return the questionnaire were contacted by phone and information about their smoking status was obtained.

Of the 618 participants (78.9%) who responded to either the questionnaire or phone survey, 113 (14.4%) reported not smoking at all since treatment, 461 (58.9%) reported smoking regularly, 25 (3.2%) reported smoking occasionally, and 19 (2.4%) reported smoking regularly at some time since the treatment, but not smoking presently. Phone survey respondents were significantly less likely to be abstinent at the follow-up than the questionnaire respondents $\underline{X}^2$ (1) = 24.09, $\underline{p} < .001$.

Subjects

This study includes data from matched pre- and follow-up questionnaires in a subsample of 219 participants. The sample consisted of 70 males and 149 females whose ages ranged from 15 to 71 ($\underline{M}$ = 42.6, $\underline{SD}$ = 12.1).

Follow-up information was used to classify participants into three smoking status groups. Exsmokers (56) had successfully abstained from smoking since the treatment. Continuing smokers (84) resumed regular smoking immediately posttreatment or had been abstinent for less than one week following treatment. Recidivists (79) had quit smoking for longer than a week ($\underline{M}$ = 75 days), but had resumed regular smoking by the one-year follow-up.

Data Analysis

Data were analyzed on a CDC 6000/Cyber 70 using the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) version 8.0. Preliminary group comparisons were calculated using analysis of variance and non-parametric techniques. Scheffe's method of post-hoc multiple comparisons with an

experimentwise error rate of .05 was used in the case of an overall significant F-ratio.

The best discriminators from the preliminary univariate analyses ($p < .10$) were introduced into a stepwise multiple discriminant analysis using smoking status group as the criterion. Missing data were handled in the analysis by substituting the between groups mean.

Within groups changes pretreatment to follow-up were examined with paired t-tests. Two-tailed tests were used to determine significance levels.

Results

Pretreatment Results

The results for sex indicate that males tended to be more successful at smoking withdrawal than females. While similar percentages of males and females relapsed (37% vs. 36%), males were more likely to be abstinent at the one year follow-up (36% vs. 21%), and females were more likely to be continuing smokers (44% vs. 27%), $X^2(2) = 7.55$, $p < .05$. Chi-squares reveal no significant differences between groups for marital status, education, and occupation.

Mean values and F-ratios for the pretreatment variables are displayed in Table 1. The data indicate no significant difference between smoking status and age, age smoking was initiated, amount smoked, or current health status. While the groups did not differ on the number of times a participant had attempted to quit F (2,203) = .51, ns, the longest duration a participant had quit previously was significant F (2,206) = 3.13, $p < .05$. Scheffe's method of post-hoc comparisons indicates that Exsmokers and Recidivists were

significantly different on this variable. The results indicate that Exsmokers on average had withdrawn from smoking for one to three months in previous attempts to quit, whereas Recidivists had remained abstinent for less than one month. There was also a trend F (2,214) = 2.40, $p < .10$ for Continuing Smokers to be more likely to have undergone hypnosis for some reason previously.

Social support items consisted of three-point scales anchored by "They made it easier (harder) to stop." The results show that spousal support in previous attempts to quit had significantly differed among the groups, F (2,147) = 3.11, $p < .05$. Inspection of the means suggests that Exsmokers had received greater spousal support, although multiple comparisons did not further distinguish the groups.

Chi-square analyses were used to evaluate the pattern of spousal smoking habits and spousal support. Although participant smoking status was not contingent on pretreatment spousal smoking habits, $X^2(6) = 2.09$, ns, there was a significant trend for spousal support to be contingent on spousal habits, $X^2(6) = 11.95$, $p = .06$. When participant smoking status was controlled, spousal support was contingent on spousal habits for Continuing Smokers, $X^2(6) = 12.77$, $p < .05$. Continuing Smokers rated 65.4% of their spouses who never smoked or stopped smoking completely as making it easier for them to quit in the past, and only 3.6% of their abstinent spouses as making it harder for them to quit. On the other hand, only 32.1% of the spouses who either never tried to stop or had been unsuccessful at stopping were rated as making it easier to quit in the past, while 39.3% of the smoking spouses were rated as making it harder to quit.

Means for both expressed confidence in being able to stop smoking and in being able to stay quit once the participant stopped were in

the expected direction, but did not reach statistical significance, *F*s (2,213) = 2.27, 2.21, *p*s < .12.

Participants responded to the health belief items on six-point Likert-type scales from strongly disagree (1) to strongly agree (6). Significant differences among the smoking status groups were found for pretreatment health beliefs on the relationship of smoking to emphysema *F* (2,212) = 4.92, *p* < .01, and heart disease *F* (2,214) = 4.40, *p* < .05. Results of Scheffe's procedure indicate that Continuing Smokers more strongly agreed with the statement that smoking is a major contributing cause of these diseases than Exsmokers.

The only other noteworthy pretreatment health belief concerned whether smoking affects the health of unborn children. Recidivists more strongly agreed with the statement than the other groups, but the difference did not reach significance, *F* (2,207) = 2.24, *p* < .11.

While the smoking status groups were quite similar with regard to the internality of their health locus of control, *F* (2,212) = .02, ns, a trend towards significant differences among the groups appears in the extent to which chance, *F* (2,206) = 2.48, *p* < .10, and powerful others, *F* (2,207) = 2.44, *p* < .10, were perceived as responsible for their health. The mean values suggest, that for these groups, Recidivists perceived their health most contingent on chance or fate and powerful others, and Exsmokers perceived their health least contingent on these factors.

One-Year Follow-up Results

Mean values and *F* ratios at the one-year follow-up are displayed in Table 2. Recidivists reported smoking significantly

fewer cigarettes than Continuing Smokers, F (1,157) = 7.93, p < .01. Paired t-tests indicate that both Recidivists and Continuing Smokers had reduced their reported smoking from pretreatment levels, t (75) = 6.05, p < .001, t (81) = 4.19, p < .001, respectively.

Smoking group status appears to be contingent on whether participants attended additional hypnosis sessions. Twenty-three percent of the Recidivists and 18% of the Continuing Smokers attended additional sessions as compared to 6% of the Exsmokers, $X^2(2) = 7.25$, $p < .05$.

The follow-up data show that the groups differed significantly on ratings of their current health status, F (2,212), p < .001. Multiple comparisons reveal that Exsmokers rated their current health higher (between very good and excellent) than the Recidivists and Continuing Smokers. In addition, the Exsmokers health ratings had increased at follow-up over their pretreatment levels, t (54) = 3.46, p < .001.

The results for social support indicate a significant difference among the groups for the support of spouses, F (2,151) = 13.77, p < .001, parents, F (2,104) = 3.60, p < .05, other family members, F (2,139) = 3.52, p < .05., and friends F (2,155) = 7.62, p < .001 for participants' smoking withdrawal efforts after the hypnosis session. Scheffe's test shows that Exsmokers perceived greater spousal support than Recidivists and Continuing Smokers, and that Exsmokers perceived greater support from parents, other family, and friends than Continuing Smokers. The within groups changes also reveal that Exsmokers perceived greater support at follow-up from spouses, t (33) = 2.03, p = .05, parents, t (22) = 2.61, p <

.05, other family, t (30) = 3.76, $p < .001$, and friends, t (38) = 5.14, $p < .001$, than at pretreatment. Recidivists also perceived greater spousal support at follow-up than at pretreatment t (48) = 2.25, $p < .05$.

Of the measured beliefs concerning smoking and health, only differences among the groups in the belief that others' smoking affects healthy adults approached statistical significance at follow-up, F (2,204) = 2.74, $p < .10$. The data suggest that Exsmokers increased their agreement with this view between the treatment and follow-up, t (52) = -2.02, $p < .05$. Exsmokers also tended to strengthen their belief that smoking is a major contributing cause of heart disease, t (52) = -1.96, $p < .10$, and that smoking affects unborn children, t (51) = -2.06, $p < .05$, over this time. On the other hand, Continuing Smokers significantly weakened their belief in smoking as a major contributing cause of heart disease, t (81) = 4.09, $p < .001$.

The two coping behaviors measured at follow-up significantly distinguished the groups. A highly significant difference for participant's expressing an objection to others' smoking around them, F (2,216) = 20.34, $p < .001$, appears due to the Exsmokers objecting at a significantly ($p < .05$) higher rate (M = 2.38) than either the Recidivists (M = .75) or Continuing Smokers (M = .50) since the treatment.

At follow-up, participants were asked to identify from a list the settings where they had requested or used a nonsmoking section. The list of settings included restaurants, public transportation, hotel rooms, bingo halls, and work places. A highly significant difference among the groups for the variety of nonsmoking accommodations F

(2,200) = 17.89, $p<.001$, appears due to the greater ($p<.05$) number of settings used by Exsmokers ($M = .98$) as compared to Recidivists ($M = .28$) and Continuing Smokers ($M = .23$). Fifty-three percent of Exsmokers used a nonsmoking area in a restaurant as compared to 12% for Recidivists and 8% for Continuing Smokers, $X^2(2) = 42.33$, $p < .001$. Also, more Exsmokers used nonsmoking areas in public transportation (32%) than Recidivists (12%) and Continuing Smokers (6%), $X^2(2) = 16.68$, $p < .001$.

The results for the HLC subscales show that the groups differed significantly on internality at the follow-up, $F(2,153) = 4.96$, $p < .01$. Recidivists were significantly ($p < .05$) less internal than the other groups. Apparently, Recidivists became more extenally controlled between the treatment and followup, $t(53) = 3.93$, $p < .001$.

Although group differences for the powerful others subscale did not reach statistical significance, $F(2,152) = 2.17$, $p < .12$, a trend is evident for Recidivists to have decreased the perceived responsibility for their health that powerful others have, $t(53) = 1.85$, $p < .10$.

Discriminant Analysis Results

Pretreatment and follow-up variables found to be significant or approaching significance in the univariate tests were introduced into a stepwise multiple discriminant analysis for smoking group status. The number of cigarettes smoked at follow-up, however, was excluded because of its association with the group membership criteria. A summary table of the variables contributing to the discriminant analysis is displayed in Table 3. Examiniation of the F-ratios performed among the groups in Table 4 suggests that while the groups

are significantly different, Recidivists are more similar to continuing Smokers than to Exsmokers, and Continuing Smokers and Exsmokers are the least similar.

The discriminant analysis yields two significant discriminant functions (Table 5). Wilks lambda, a measure of residual discrimination is .495, $\underline{X}^2(32) = 146.42$, $\underline{p} < .0001$, prior to the first function, and .855, $\underline{X}^2(15) = 32.61$, $\underline{p} < .01$, prior to the second. The first function discriminates Exsmokers from the other groups, and the second function discriminates Recidivists from the other groups. The first function contains about 81% of the total discriminating power of the equations and 42% of the variance explained by the groups, $\underline{R} = .649$. The second function contains about 19% of the total discriminating power and 14% of the variance explained by the groups, $\underline{R} = .381$.

The within structure matrix presented in Table 6 will be used to interpret the discriminant functions. Unlike the standardized coefficients whose magnitude is affected by intercorrelations among the variables, the structure coefficients are simple bivariate correlations between variables and discriminant functions. The correlations reported in the within structure (within groups) matrix tend to be smaller, but of a similar rank-ordering to the total structure (between groups) matrix (Klecka, 1980). Note that the sign of the structure coefficients is dependent on the location of the group centroid along the discriminant function and the direction of scaling for the variable.

The results for Function 1 indicate that Exsmokers subsequent to treatment tended to have objected to others smoking around them, used or requested nonsmoking areas in public accommodations, rated their

health status positively, and received support from spouses and friends. Exsmokers also tended to be male and hold less strong beliefs at pretreatment that smoking causes heart disease than the other groups.

The results for Function 2 indicate that Recidivists prior to treatment tended to have quit smoking for short time periods, received little hypnosis, endorsed strong beliefs that smoking affects unborn children, and perceived control by powerful others over their health. At the follow-up, Recidivists tended to have received additional hypnosis, obtained support from spouses, used few nonsmoking areas, and perceived reduced personal control over their health.

The two functions could correctly classify 63.0% of the participants into their smoking status groups. Predicted groups membership was most accurate for Exsmokers (69.6%) and least accurate for Recidivists (53.2%). About 32% of the Recidivists were misclassified as Continuing Smokers. Prediction accuracy for Continuing Smokers was close to that of Exsmokers (67.9%). Thus, classification based on the discriminating variables made 44.8% fewer errors than would be expected by random assignment.

Discussion

This study identified several factors mediating relapse and long-term abstinence following smoking cessation. A major finding was the importance of two coping behaviors. In accordance with our prediction, individuals who objected to others smoking around them and who used or requested nonsmoking areas in public accommodations were more likely to be nonsmokers a year following cessation than individuals who did not engage in these behaviors. Importantly, low

performance of the measured coping behaviors significantly discriminated those who relapsed from the other groups.

It is worth noting that the treatment was oriented towards desensitizing participants to pressures to smoke rather than in encouraging more active methods of coping. Incorporating active coping skills into the treatment program may have further separated the groups. The evidence presented here, in addition to the findings of other researchers (Evans & Lane, 1981; Marlatt & Gordon, 1980; Shiffman, 1982) supports the important role of coping skills in the process of becoming a nonsmoker and the prevention of relapse.

With reference to the Health Locus of Control scales, pretreatment internality did not predict smoking status at the one-year follow-up in contrast to Shipley's (1981) results for a six-months follow-up. However, those individuals who relapsed had significantly lower internality scores at follow-up than other groups. The data suggest that a loss of preceived control over one's health is attendant on relapse since recidivists significantly decreased their internality between the treatment and follow-up surveys.

This loss of perceived personal control for recidivists is consistent with Marlatt's (Marlatt & Gordon, 1980) conception of the abstinence violation effect. He suggests that following a violation of abstinence smokers a) experience cognitive dissonance between their self-image as abstainers and the behavioral act of smoking, and b) attribute the failure to remain abstinent to internal personal weaknesses and an inability to control taboo behaviors. It is plausible that generalized expectancies regarding control over one's health would be affected by the abstinence violation effect.

Recidivism was also predicted by high chance and powerful other HLC scores. However, at follow-up, Recidivists appear to have reduced the degree of responsibility that powerful others are perceived to have over their health. It seems reasonable that this change would occur in a method of smoking withdrawal which maximizes participant dependence on the therapist.

Social support, particularly that of spouse and friends, was confirmed as predicted to be an important factor differentiating those individuals successful at smoking cessation from those individuals who failed to stop smoking or quit for a brief period of time. Exsmokers perceived significantly greater social support at follow-up from all the sources measured than at pretreatment.

Curiously, smokers who relapsed also tended to perceive high spousal support following treatment. This may reflect a tendency to credit spousal support for the success experienced prior to relapse and/or to blame oneself rather than others for failing to maintain abstinence.

These results suggest that spousal support may be particularly crucial for motivating smoking withdrawal and during the period immediately following cessation. Longer-term success appears to require personal resources in addition to social support, such as adequate coping skills.

The finding that Continuing Smokers held stronger beliefs that smoking caused emphysema and heart disease prior to treatment is somewhat unexpected. The health belief model suggests that it is not sufficient for individuals to believe that smoking is a health problem, they must see their behavior as a serious personal health threat before they will quit (Weinberger, et.al.,1981). While

perceptions of personal vulnerability to health problems from smoking were not assessed in this study, it seems reasonable to expect persons with strong beliefs in the adverse health effects of smoking (Continuing Smokers) to be more likely to perceive personal health threats. This should especially hold when the groups do not differ significantly in perceived health status as was the case here. Yet, in contrast to this analysis, Continuing Smokers were notably unsuccessful at cessation.

An alternative explanation which is consistent with the observed outcome for Continuing Smokers is that their extreme ratings reflect a fatalistic view regarding smoking and health as has been suggested by Eisinger (1971) and Straits (1970) for recidivists. Although the results on the Chance subscale of the HLC scales tends to support the interpretation of fatalism for recidivists, it does not support it for Continuing Smokers. Thus, the findings reviewed here concerning the relationship between health beliefs and success at smoking cessation are not readily interpretable within the health belief model.

Changes noted in health beliefs between treatment and follow-up could be explained by cognitive dissonance. Those participants successful at smoking cessation (Exsmokers) tended to strengthened their belief in the harmful effects of smoking. In contrast, those participants unsuccessful at smoking cessation (Continuing Smokers), tended to weaken their belief in the harmful effects of smoking, at least with regard to heart disease.

An alternative explanation with regard to Exsmokers' ratings for the affect of other's smoking on healthy adults is that Exsmokers found ambient cigarette smoke (passive smoking) more annoying than they had as smokers. This interpretation would be consistent with

anecdotal reports of Exsmokers' physiological and psychological response to passive smoking.

That Exsmokers perceived their health status at follow-up as significantly improved over pretreatment levels is consistent with findings of a reduced prevalence of symtoms following cessation (Smoking & Health, 1979).

Of the demographic variables measured, only sex was found to differentiate smoking status groups such that females were more likely to be continuing smokers and less likely to be exsmokers at follow-up. Recidivists were about evenly split between males and females. This replicates previous findings of poorer outcomes for smoking cessation among female participants. (e.g., West et.al.,1977).

The duration of previous cessation efforts was found to be a significant pretreatment discriminator of recidivism. Inability to maintain abstinence for longer than one month in prior cessation attempts appears to be predictive of relapse.

In sum, the typical exsmoker in this study actively coped with smokers in his/her environment, avoided other smokers in public places, and received considerable support from spouses and friends. In contrast, the typical recidivist prior to treatment had been unable to quit for extended periods of time and placed greater responsibility on powerful others for his/her health. Following treatment, recidivists did not actively cope with smokers in his/her environment, were more likely to participate in additional hypnosis, and placed less responsiblity on either powerful others or themselves for their own health.

Several other outcomes of this study deserve mentioning. First, the psychological consequences of failure at smoking withdrawal appear

to be more extreme for recidivists than continuing smokers. Recidivists experienced a loss in their sense of personal control over their health and in their sense of control that powerful others have over their health. This may reflect the fatalistic outlook for recidivists described by Eisinger (1971) and Straits (1970). Although, recidivists did score higher on the Chance subscale of the HLC scales than the other groups at follow-up, they did not score significantly higher.

Secondly, few of the pre-treatment variables were predictive of outcome at the one year follow-up. Only duration of previous abstinences, spousal support, and two health belief items were significantly different for the groups. No socio-demographic or other smoking background variables were significant. In contrast, health locus of control, social support, and behavioral coping measured at follow-up did tend to distinguish the groups. The data suggest that these posttreatment variables may be a more important factor in the maintenance of nonsmoking than entry characteristics of participants.

Thirdly, while results of the discriminant analysis were only modestly successful in accurately classifying discriminant participants by smoking status, the functions show that recidivists can be distinguished from both exsmokers and continuing smokers in regards to the variables measured here.

Limitations and Implications

The self-report methodology of this study is its major limitation. While self-reports of smoking habits tend to be reliable (Colletti, Supnick, & Abueg; 1982), the retrospective nature of the

follow-up in particular could introduce bias due to loss of recall over time or the influence of degree of success on reporting past events. Generalizability may also be limited by special characteristics of hypnotherapy participants or by the effects of this type of minimal smoking treatment.

The findings reported here suggest that coping skills training should be incorporated into smoking control programs. Prospective exsmokers, for example, could be trained to assertively refuse the offer of a cigarette or to assertively request persons not to smoke around them (Pachman & Frederickson, 1979). Also, direct involvement of spouses and peers in smoking cessation programs could increase the social support for quitting and staying quit. Worksite-based interventions would seem to hold particular promise for generating peer support for cessation.

Finally, efforts to restrict smoking in public accommodations have typically been justified on the grounds of protecting the health and well-being of nonsmokers or to prevent the initiation of smoking among children and teenagers (Jason, 1979; Shor & Williams, 1978; Smoking and Health, 1979). The findings of this study support the view that recent exsmokers who are at risk of relapse would benefit from further environmental and community interventions to restrict smoking.

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Table 1

Pre-Treatment Means and F-Statistics

Variable	Group Means: Exsmokers	Recidivists	Continuing Smokers	F
Smoking Background				
Age	43.16	40.97	43.86	1.24
Cigarettes Smoked Currently	32.27	31.16	31.99	.15
Age Started Smoking	17.46	17.99	17.39	.51
Previous Attempts to Quit	3.70	3.62	4.03	.51
Longest Period Quit	3.80	2.96	3.34	3.13**
Previous Hypnosis	.09	.11	.24	2.49**
Confidence of Quitting[a]	2.75	2.99	3.11	2.27
Confidence of Staying Quit[a]	2.25	2.49	2.61	2.21
Current Health Status[a]	1.98	2.03	2.20	.18
Social Support				
Support of Spouse[a]	1.42	1.75	1.76	3.11**
Support of Parents[a]	1.88	1.84	1.86	.05
Support of Other Family[a]	1.85	1.81	1.75	.36
Support of Friends[a]	2.09	1.98	1.97	.44
Health Beliefs				
Smoking Causes Cancer	4.87	4.99	5.11	.52
Smoking Causes Emphysema	4.94	5.38	5.57	4.92***
Smoking Causes Heart Disease	4.57	4.92	5.24	4.40**
Smoking Affects Unborn Children	4.48	4.96	4.83	2.24
Others' Smoking Affects Young Children	4.60	4.77	4.70	.27
Others' Smoking Affects the Elderly	4.78	4.85	4.69	.31
Others' Smoking Affects Healthy Adults	4.20	4.27	4.20	.95

* $p < .10$ ** $p < .05$ *** $p < .01$

[a]Lower scores on these items indicate higher ratings

Table 1 (Cont'd)

Variable	Exsmokers	Recidivists	Continuing Smokers	F
Health Locus of Control				
Internality	27.65	27.57	27.48	.02
Chance	14.62	16.91	15.72	2.48*
Powerful Others	17.06	19.25	18.58	2.44*

* $p < .10$ ** $p < .05$ *** $p < .01$

[a] Lower scores on these items indicate higher ratings

Table 2

One Year Follow-up Means and F-Statistics

Variable	Group Means: Exsmokers	Recidivists	Continuing Smokers	F
Smoking Background				
Cigarettes Smoked Currently	-----	23.68	28.28	7.93***
Current Health Status[a]	1.69	2.03	2.22	8.69***
Social Support				
Support of Spouse[a]	1.23	1.51	1.88	13.77****
Support of Parents[a]	1.57	1.70	1.91	3.60**
Support of Other Family[a]	1.43	1.58	1.76	3.52**
Support of Friends[a]	1.53	1.77	1.98	7.62****
Health Beliefs				
Smoking Causes Cancer	5.17	4.90	4.99	.87
Smoking Causes Emphysema	5.31	5.06	5.38	1.59
Smoking Causes Heart Disease	5.06	4.86	4.76	1.04
Smoking Affects Unborn Children	4.92	4.72	4.75	.45
Others' Smoking Affects Young Children	4.87	4.55	4.51	1.23
Others' Smoking Affects the Elderly	4.85	4.59	4.51	1.04
Others' Smoking Affects Healthy Adults	4.65	4.09	4.09	2.74*
Behavioral Coping				
Objections to Others' Smoking	2.38	.75	.50	20.34****
Nonsmoking Areas Used/Requested	.98	.28	.23	17.89****

* $p < .10$ ** $p < .05$ *** $p < .01$ **** $p < .001$

[a]Lower scores on these items indicate higher ratings

Table 2 (Cont'd)

Variable	Exsmokers	Recidivists	Continuing Smokers	F
Health Locus of Control				
Internality	27.36	24.22	26.90	4.96***
Chance	16.17	16.70	14.77	1.53
Powerful Others	16.81	17.61	19.10	2.17

* $p < .10$ ** $p < .05$ *** $p < .01$ **** $p < .001$

[a]Lower scores on these items indicate higher ratings

Table 3

Summary Table of Multiple Discriminant Analysis for Pretreatment and One-Year Followup Variables

Step	Variable	Wilks Lambda *
1	Objections to Others' Smoking	.8415
2	Nonsmoking Areas Used/Requested	.7584
3	Support of Spouse (F)	.7072
4	Believe Smoking Causes Heart Disease (P)	.6684
5	Current Health Status (F)	.6339
6	Internal Health Locus of Control (F)	.6085
7	Previous Hypnosis	.5905
8	Believe Smoking Affects Unborn Children (P)	.5747
9	Support of Friends (F)	.5611
10	Sex	.5466
11	Additional Hypnosis	.5357
12	Longest Period Quit (P)	.5232
13	Support of Spouse (P)	.5156
14	Believe Others' Smoking Affects Healthy Adults (F)	.5092
15	Powerful Others Health Locus of Control (P)	.5029
16	Powerful Others Health Locus of Control (F)	.4955

Note: P = Pretreatment, F = One-Year Followup

* All ps < .0001

Table 4

F-Matrix Discriminating Exsmokers, Recidivists,

And Continuing Smokers

	Exsmokers	Recidivists
Recidivists	5.52	
Continuing Smokers	8.99	2.82

All Fs (16, 201), P< .001

Table 5

Standardized Coefficients for Significant Discriminators

Variable	Function 1 *	Function 2 **
Pretreatment		
Sex	.211	-.208
Longest Period Quit	-.121	-.336
Previous Hypnosis	.208	-.300
Support of Spouse	.199	.078
Believe Smoking Causes Heart Disease	.485	-.305
Believe Smoking Affects Unborn Children	-.132	.535
Powerful Others Locus of Control	.014	.415
One Year Follow-up		
Additional Hypnosis	-.210	-.296
Current Health Status	.281	-.141
Support of Spouse	.309	-.409
Support of Friends	.282	-.069
Believe Others' Smoking Affects Healthy Adults	-.172	-.154
Internal Locus of Control	.093	-.502
Powerful Others Locus of Control	.132	-.307
Objections to Others' Smoking	-.430	-.071
Nonsmoking Areas Used/Requested	-.393	-.196

* Discriminates Exsmokers from other groups

** Discriminates Recidivists from other groups

Table 6

Within Structure Matrix for Significant Discriminators

Variable	Function 1	Function 2
Objections to Others'Smoking	-.501	-.191
Nonsmoking Areas Used/Requested	-.461	-.257
Support of Spouse (F)	.384	-.230
Current Health Status (F)	.332	-.063
Support of Friends (F)	.307	-.073
Believe Smoking Causes Heart Disease (P)	.229	-.115
Sex	.216	-.100
Support of Spouse (P)	.185	.119
Believe Others' Smoking Affects Healthy Adults (F)	-.178	-.126
Powerful Others Locus of Control (F)	.154	-.137
Internal Locus of Control (F)	-.070	-.493
Longest Period Quit	-.133	-.309
Additional Hypnosis	-.175	-.264
Powerful Others Locus of Control (P)	.138	.228
Previous Hypnosis	.143	-.221
Believe Smoking Affects Unborn Children (P)	.136	.209

Note: Variables are ordered by the function with largest correlation and the magnitude of that correlation.